

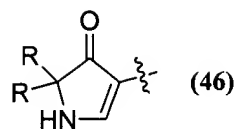
This listing of claims will replace all prior versions, and listings, of claims in the application:

We claim:

- $$\left[ \text{R}^4 - \text{C}(\text{R})\left( \begin{array}{c} \text{HN} \\ \diagup \\ \text{C} \\ \diagdown \\ \text{C}=\text{O} \end{array} \right) - \text{C}(\text{R})\left( \begin{array}{c} \text{O} \\ \diagup \\ \text{C} \\ \diagdown \\ \text{HN} \end{array} \right) - \text{C}(\text{R}^1)(\text{R}^2)(\text{R}^3) \right]_n \quad (38)$$

R is independently selected from a group consisting of a straight C<sub>1</sub>-C<sub>6</sub> alkyl, a branched C<sub>3</sub>-C<sub>7</sub> alkyl, C<sub>3</sub>-C<sub>7</sub> cycloalkyl, a straight C<sub>1</sub>-C<sub>6</sub> alkenyl, a branched C<sub>3</sub>-C<sub>7</sub> alkenyl, C<sub>1</sub>-C<sub>4</sub> hydroxyalkyl, C<sub>1</sub>-C<sub>4</sub> thioalkyl, C<sub>1</sub>-C<sub>4</sub> methylthioalkyl, -(CH<sub>2</sub>)<sub>0</sub>N(R<sup>5</sup>)<sub>2</sub>, -(CH<sub>2</sub>)<sub>0</sub>CO<sub>2</sub>H, -(CH<sub>2</sub>)<sub>0</sub>CON(R<sup>5</sup>)<sub>2</sub>, heteroaryl, phenyl optionally substituted with one to three hydroxyl, ~~lower~~ C<sub>1</sub>-C<sub>8</sub> alkoxy, halo, nitro, or cyano groups, and ~~C<sub>7</sub>-C<sub>12</sub>~~ benzyl optionally substituted with ~~the same groups as above or heteroaryl~~ one to three hydroxyl, C<sub>1</sub>-C<sub>8</sub> alkoxy, halo, nitro or cyano groups;

$R^4$  is  $R$  or (46);



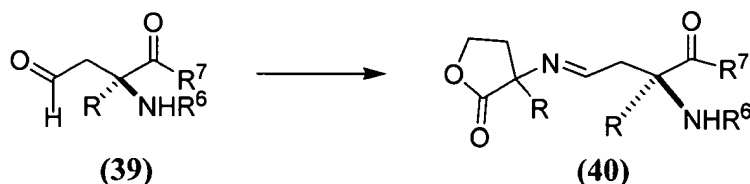
$R^5$  is hydrogen or ~~lower~~  $C_1$ - $C_8$  alkyl;

$n$  is 0 to 3;

$o$  is 1 to 4;

comprising the steps:

- (a) ~~exposing~~ reacting an  $\alpha$ -amino- $\alpha$ -substituted-1,4-dioxo compound (39), optionally with an alkoxycarbonyl protecting group, ~~to a plurality of treatments~~ with a 2-substituted-2-aminovalerolactone, trimethylorthoformate, optionally in the presence of a solvent, to produce imine (40)



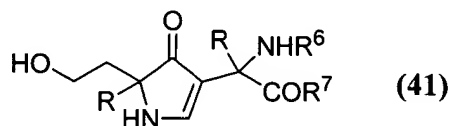
wherein:

$R^6$  is an amino protecting group,

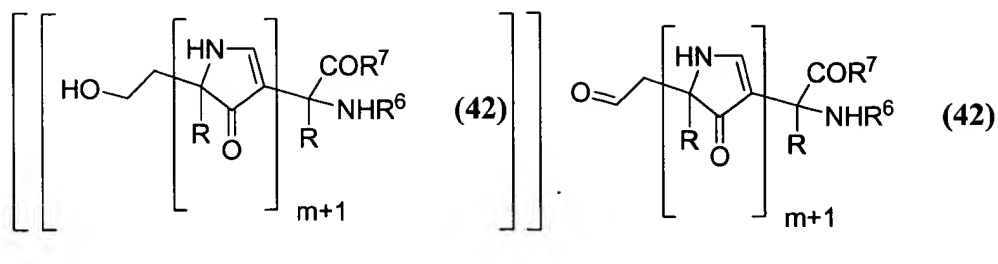
$R^7$  is a  $C_1$ - $C_4$  alkoxy or a carboxyl or carbamido linked to a solid support, or

$R^6$  and  $R^7$  together form a pyrrolinone ring;

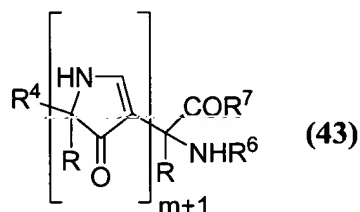
- (b) cyclizing (40) by forming metalloimine carbanion with base optionally in the presence of a crown ether to form a pyrrolinone (41);



- (c) oxidizing the primary alcohol to the corresponding aldehyde;
- (d) repeating steps (a)-(c)m times to produce polypyrrolinone (42);

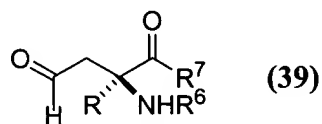


(e) terminating the synthesis by repeating steps (a) through ~~(e)~~(b) using  $\alpha$ -substituted amino acid ester in



(f) place of the valerolactone in step ~~(b)~~(a) to yield (43).

- (Original): A process according to claim 1 wherein said polypyrrolinones are substantially diastereomerically pure.
- (Currently amended): A process according to Claim 1 wherein the initial  $\alpha$ -amino- $\alpha$ -substituted-1,4-dioxo compound is a compound (39) and  $\text{R}^6$  is an alkoxy carbonyl

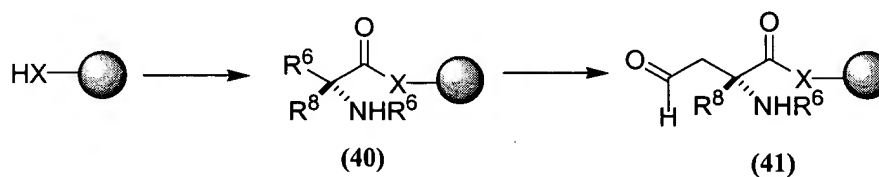


protecting group, R is as defined above and  $\text{R}^7$  is a ~~lower~~ C<sub>1</sub>-C<sub>8</sub> alkoxy group,

- (Original): A process according to claim 1 wherein the oxidant in step (c) is oxalyl chloride, a tertiary amine and DMSO.
- (Original): A process according to Claim 4 wherein the tertiary amine is DBU or di-*iso*-propylethyl amine.

6. (Original): A process according to Claim 1 wherein the crown ether in step (b) is 18-crown-6.
7. (Original): A process according to Claim 1 wherein the base in step (b) is potassium hexamethyldisilazane.
8. (Withdrawn): A solid-phase process according to claim 1 wherein  $R^7$  is a carboxyl or carbamido linked to a solid support further comprising the steps of:

(f) attaching a latent aldehyde (40) to a solid support wherein and converting the latent aldehyde to an aldehyde (41);

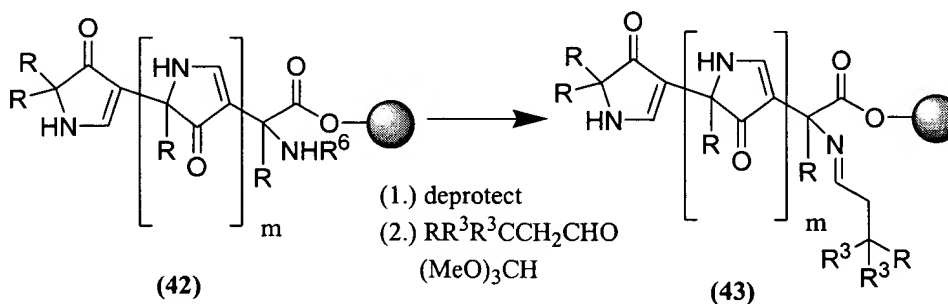


wherein:

$R^8$  is 3-methyl-1-but-2-enyl, 2,2-dimethoxyethyl, 2-hydroxyethyl, and

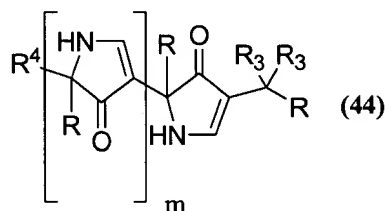
X is nitrogen or oxygen;

(g) repeating steps (a)-(c) m times and terminating the synthesis as in step (e) to produce polypyrrolinone (42);

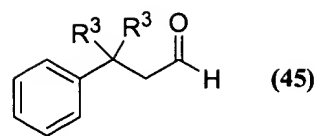


(h) cleaving the polypyrrolinone from the resin by deprotecting the  $\alpha$ -amino group, and exposing the  $\alpha$ -amino acid to a plurality of treatments with an aldehyde, trimethylorthoformate, optionally in the presence of a solvent, to produce the corresponding imine (43); and,

(i) cyclizing (43) by forming the metalloimine carbanion with base, optionally in the presence of a crown ether, to produce a pyrrolinone (44).



9. (Withdrawn): A process according to claim 7 wherein the oxidant in step (c) is oxalyl chloride, a tertiary amine and DMSO.
10. (Withdrawn): A process according to Claim 7 wherein the tertiary amine is DBU or di-*iso*-propylethyl amine.
11. (Withdrawn): A process according to Claim 7 wherein the crown ether in step (b) is 18-crown-6.
12. (Withdrawn): A process according to Claim 7 wherein the base in step (b) is potassium hexamethyldisilazane.
13. (Withdrawn): A process according to Claim 7 wherein R<sup>6</sup> is a trialkylsilylethoxycarbonyl group.
14. (Withdrawn): A process according to Claim 7 wherein the aldehyde in step (h) is a 3-phenylpropionaldehyde (45) derivative optionally substituted at the 3-position with one or two R<sup>3</sup> substituents.



15. (Withdrawn): A process according to Claim 7 wherein the aldehyde in step (h) is 3-phenylpropionaldehyde.